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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,072	01/16/2002	Kazuya Kubo	Q68120	2422

7590

09/29/2003

SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC  
2100 Pennsylvania Avenue, N.W.  
Washington, DC 20037

EXAMINER
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OLTMANS, ANDREW L

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 09/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/046,072

Applicant(s)

KUBO ET AL.

Examiner

Andrew L Oltmans

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

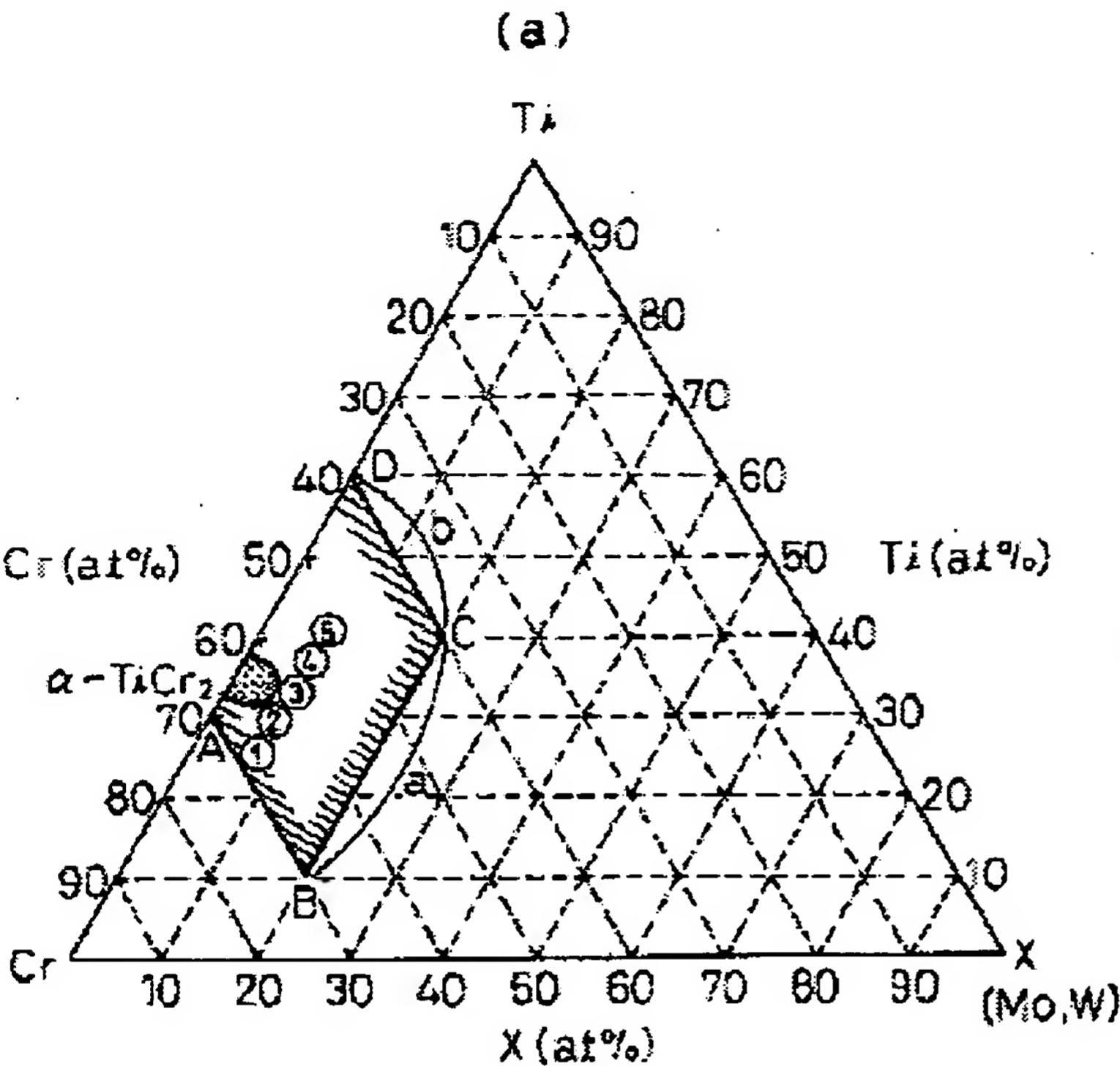
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

#### *Japanese Patent JP 10-121180 A*

2. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent JP 10-121180 A (JP '180).

NOTE: All references to the JP '180 reference are to the English Language abstract (PAJ) or the English Language translation provided by the example, unless otherwise indicated.

JP '180 teaches a hydrogen storage alloy having a Ti-Cr-Mo formula, wherein the structure of the alloy is body-centered cubic (abstract), as recited in claims 1 and 2. JP '180 further teaches a method wherein the hydrogen storage alloy is heat treated at conditions encompassed by the conditions instantly claimed, including a water quench (i.e. cooling at a rate not less than the speed of water cooling) (abstract; paragraph [0014]), as recited in claims 3-4. JP '180 teaches ranges of Ti, Cr and Mo that overlap the ranges recited in the instant claims (abstract) and further teaches specific embodiments that are fully encompassed by the claims, as recited in claims 1 and 2 (see Japanese Language Patent Figure 1):



(b)

	(at%)		
	Ti	Cr	X
①	27	66	7
②	30	63	7
③	33	60	7
④	36	57	7
⑤	39	54	7

The claims do not distinguish over the teachings of JP '180.

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It is noted that claim 2 is anticipated by JP '180 despite the recitation of Fe, because the claimed compositional concentration of Fe (i.e. "d") is "not larger than 15% by atomic weight" (claim 2, lines 7-8), which encompasses zero.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***Japanese Patent JP 04-210446 A in view of Japanese Patent JP 10-121180 A***

4. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent JP 04-210446 A (JP '446) in view of Japanese Patent JP 10-121180 A (JP '180).

NOTE: All references to the JP '446 reference are to the English Language abstract (PAJ) or the English Language translation provided by the example, unless otherwise indicated.

JP '446 teaches a hydrogen storage alloy composition have the general formula  $Ti_xCr_{2-y}Mo_y$  (where  $0.8 \leq x \leq 1.2$  and  $0 < y \leq 1.0$ ) or the general formula  $Ti_xCr_{2-y-z}Mo_yFe_z$  (where  $0.8 \leq x \leq 1.2$ ,  $y > 0$  and  $z \leq 1.0$ ) wherein JP '446 teaches that the alloy is refined, cooled and crushed (abstract). JP '446 teaches compositional ranges for Ti, Cr, Mo and Fe that overlap the ranges instantly claimed (abstract) and further teaches specific embodiments fully encompassed by the compositional ranges, as recited in claims 1-2 (Japanese Language Patent Figure, page 3):

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試料 No.	合金組成	水素吸蔵量 (cc/g)	水素放出量 (cc/g)	効率 (%)	反応 速度
発 明 材	1 Ti Cr <sub>1.5</sub> Mo <sub>0.5</sub>	330	240	73	○
	2 Ti Cr <sub>1.5</sub> Mo <sub>0.5</sub>	340	270	79	○
	3 Ti Cr <sub>1.5</sub> Mo <sub>0.5</sub>	330	240	73	○
	4 Ti Cr Mo <sub>0.5</sub> Fe <sub>0.5</sub>	320	250	78	○
	5 Ti Cr <sub>1.5</sub> Mo <sub>0.5</sub> Fe <sub>0.5</sub>	310	230	74	○
比 較 材	6 Ti Cr <sub>2</sub>	190	140	74	○
	7 V	410	230	56	×

JP '446 fails to meet all the limitations of the instant claims in that JP '446 does not explicitly teach the structure of the alloy, or the heat treatment steps recited in the claims.

JP '180 teaches a method wherein the hydrogen storage alloy is heat treated at conditions encompassed by the conditions instantly claimed, including a water quench (i.e. cooling at a rate not less than the speed of water cooling) (abstract; paragraph [0014]), as recited in claims 3-4.

JP '180 further teaches that the method of heat treatment and rapid cooling results in an equalization of the body centered cubic (BCC) structure and desirably provides a hydrogen storage alloy having increased hydrogen storage capacity, decreased manufacturing cost, and is an optimal manufacturing process capable of an industrial scale (paragraphs [0006] and [0007]).

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One of ordinary skill in the art at the time that the invention was made would have found the invention to be obvious because one of ordinary skill in the art would have been motivated to heat treat the alloy of JP '446 according the treatment taught in JP '180 in order to provide the JP '446 with the desirable properties of a hydrogen storage alloy having increased hydrogen storage capacity, decreased manufacturing cost, and is an optimal manufacturing process capable of an industrial scale, wherein the structure includes the BCC structure, as taught in JP '180 (JP '180: paragraphs [0006] and [0007]).

### *Conclusion*

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew L. Oltmans whose telephone number is 703-308-2594. The examiner can normally be reached 7:00-3:30 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
Andrew L. Oltmans  
Examiner  
Art Unit 1742

September 12, 2003